

# Implications of MAP-21 Performance Measures for Local Agencies

**Simon Lewis, PhD**

**McMahon Associates**

**MAGTUG – Burlington County GIS Day Workshop**

**11/13/14**

## Quote:

*Accessibility is not an end in itself; it's a means to other ends ..  
if the purpose of an urban transportation system is accessibility,  
we should work to make the system serve that goal*

*Reason Foundation*

- How do we define accessibility?
- What is the Performance Measure for Accessibility?

# PM – One Introduction!

- ❑ **One view, one introduction**
- ❑ **Intended to frame and guide the local agency PM review and selection processes**
- ❑ **Much field literature --- need "a cut" or digestion!**

# PM Background 1

Federal Legislation in MAP-21 raised PM awareness for a;; transportation agencies, by:

- ❑ not only by conditioning future funding on the systematic adoption of performance measures
- ❑ but also by requiring that measures be mapped to target network improvements.

# P.M.s and Geospatial Professionals

Why should geospatial professionals concerned with Performance Measures?

*Possible answers:*

- Is Performance (and its measurement) all our ultimate end goal?
- Much of what public agencies do has spatial location: safety, accessibility, permits, pavements, infrastructure, urban trees, etc.
- Agencies become more performance focused?
- Advise on metrics– data quality variability questions
- So -- GIS professionals a critical role in development, stewardship, and analysis of transportation system performance measures.

# Theme of the Decade? - “Give me Value”

- The theme for this workshop arose from proposals in an open call from our MAGTUG members
- So, an interest is clear!
- The theme may be carried into future sessions
- Is PM a central theme, .. a theme of the decade?
- *Value Engineering*
- *KPI's*

# USDOT Requirement

- ❑ Map-21 requires that state Departments of Transportation implement Performance Measures (PMs) for various aspects of the transportation system, though specific measures will vary by state and even within states.
- ❑ While few PMs are now required of local agencies, the benefits of implementing PMs should be recognized regardless of whether they are required.

# MAP-21: What is it?

The **Moving Ahead for Progress in the 21st Century Act (MAP-21)** is a funding and authorization bill to govern United States federal surface transportation spending. It was passed by Congress on June 29, 2012.



# US DOT MAP-21

USDOT Implementation of MAP-21 Performance Provisions: Ten Interrelated Rules		2014				2015			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Planning</b>									
<b>Metropolitan and Statewide Planning Rule</b>	<ul style="list-style-type: none"> <li>Establish a performance-based planning process at metropolitan and state level.</li> <li>Define coordination in the selection of targets, linking planning and programming to performance targets.</li> </ul>								
<b>Highway Safety</b>									
<b>Safety Performance Measure Rule</b>	<ul style="list-style-type: none"> <li>Propose and define fatalities and serious injuries measures, along with target establishment, progress assessment and reporting requirements.</li> <li>Discuss the implementation of MAP-21 performance requirements.</li> </ul>								
<b>Highway Safety Improvement Program (HSIP) Rule</b>	<ul style="list-style-type: none"> <li>Integration of performance measures, targets, and reporting requirements into the HSIP.</li> <li>Strategic Highway Safety Plan updates.</li> </ul>								
<b>Highway Safety Program Grants Rule *</b> <small>* Interim Final Rule issued by NHTSA in January 2013.</small>	<ul style="list-style-type: none"> <li>State target establishment and reporting requirements.</li> <li>Highway safety plan content, reporting requirements, and approval.</li> </ul>								
<b>Highway Conditions</b>									
<b>Pavement and Bridge Performance Measure Rule</b>	<ul style="list-style-type: none"> <li>Propose and define pavement and bridge condition measures, along with minimum condition standards, target establishment, progress assessment and reporting requirements.</li> </ul>								
<b>Asset Management Plan Rule</b>	<ul style="list-style-type: none"> <li>Contents and development process for asset management plan.</li> <li>Minimum standards for pavement and bridge management systems.</li> </ul>								
<b>Congestion/System Performance</b>									
<b>System Performance Measure Rule</b>	<ul style="list-style-type: none"> <li>Define performance of the interstate system, non-interstate national highway system, and freight movement on the interstate system.</li> <li>Finalize interpretation of scope of CMAQ performance requirements, including congestion and on-road mobile source emissions.</li> <li>Summarize MAP-21 highway performance measure rules</li> </ul>								
<b>Transit Performance</b>									
<b>Transit Asset Management Rule</b>	<ul style="list-style-type: none"> <li>Define state of good repair and establish state of good repair performance measures</li> <li>Require transit providers to set targets and report on progress</li> <li>Transit asset management plans</li> </ul>								
<b>National Transit Safety Program Rule</b>	<ul style="list-style-type: none"> <li>Define transit safety criteria and standards</li> <li>Include definition of state of good repair</li> </ul>								
<b>Transit Agency Safety Plan Rule</b>	<ul style="list-style-type: none"> <li>Transit safety plan content and reporting requirements</li> <li>Target setting requirements for transit agencies and States</li> </ul>								
		<div style="border: 1px solid black; padding: 5px; display: inline-block;">Anticipated 2015 Final Rule Publication</div>							

# Transportation Performance Management

- ❑ A strategic approach that uses system information to make investment and policy decisions to achieve agency performance goals.
- ❑ In short, Transportation Performance Management:
  - ❖ Is systematically applied, a regular ongoing process
  - ❖ Provides key information to help decision makers allowing them to understand the consequences of investment decisions across multiple markets
  - ❖ Improving communications between decision makers, stakeholders and the traveling public.
  - ❖ Ensuring targets and measures are developed in cooperative partnerships and based on data and objective information

# What is a Performance Measure I?: How Measure?

1. How well we are doing?
2. If our processes are in statistical control?
3. If we are meeting our goals?
4. If and where improvements are necessary?
5. If our customers are satisfied?

# What is a Performance Measure II?

- Effectiveness: A process characteristic indicating the degree to which the process output (work product) conforms to requirements. (Are we doing the right things?)
- Efficiency: A process characteristic indicating the degree to which the process produces the required output at minimum resource cost. (Are we doing things right?)
- Quality: The degree to which a product or service meets customer requirements and expectations.
- Timeliness: Measures whether a unit of work was done correctly and on time. Criteria must be established to define what constitutes timeliness for a given unit of work. The criterion is usually based on customer requirements.
- Productivity: The value added by the process divided by the value of the labor and capital consumed.
- Safety: Measures the overall health of the organization and the working environment of its employees.

# Performance Management & Asset Management I

Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.(23 U.S.C. 101(a)(2), MAP-21 § 1103)

# Performance Management & Asset Management II

- The basic principles of asset management and performance management are identical.
- Good asset management must be performance-based.
- In looking to define the relationship between asset management and performance management one must recognize that broad performance management principles apply to asset management as well as other aspects of the transportation system and transportation organizations.

# Asset Management and Performance Management

The application of these principles to different aspects of the transportation system will vary in terms of:

- the appropriate performance measures
- short-term versus long-term focus
- the appropriate strategies for improving performance and
- the timeframe for being able to observe performance changes

# What are the Differences PM and AM?

- ❑ Many aspects of agency operations are *not* concerned with the management of assets
- ❑ Examples:
  - ❑ Turnpike rest-stops operations
  - ❑ Agency website



# Case Study 1: Traffic Signals

- Focused example
- Many local agencies have
- Need to be both maintained and operated

# Local Agency Traffic Signal PM's

- Cycle Length
  - *where say a signal part of a coordinated system: are they the same?*
- Equivalent Hourly Flow Rate
  - *Flow rates by signal phases; show efficiency of each phase*
- Green Time Plot
  - *Green time per phase; check efficiency*
- Volume to Capacity ratio
  - *Calculated volume to capacity; lack of capacity*
- Split Failures
  - *Number of signal cycles in 30 minute period that have pedestrian activation*

# Which are “Operational PM’s” and Which are “Agency PM’s”

- Which wish to know as the *traffic signal engineer*?
- Which wish to know as the *local agency*?
  - Key Point: Difference between “agency-level” PM’s and “operational PM’s”
  - Operational PM’s feed up to agency-level PM’s?

# What *really* are the local agency PM's??

❑ Some local municipalities may NOT want to:

- ❖ *improve throughput at intersections*
- ❖ *Improve accessibility*

❑ Reason:

- ❖ Feels it is detriment to the town
- ❖ Accessibility/mobility v “town character”

# Case Study 1: PM's for Local Agency: Traffic Signals

*Reference:*

**Performance Measures for Local Agency Traffic Signals.**

J. Grossman and D. M Bullock.

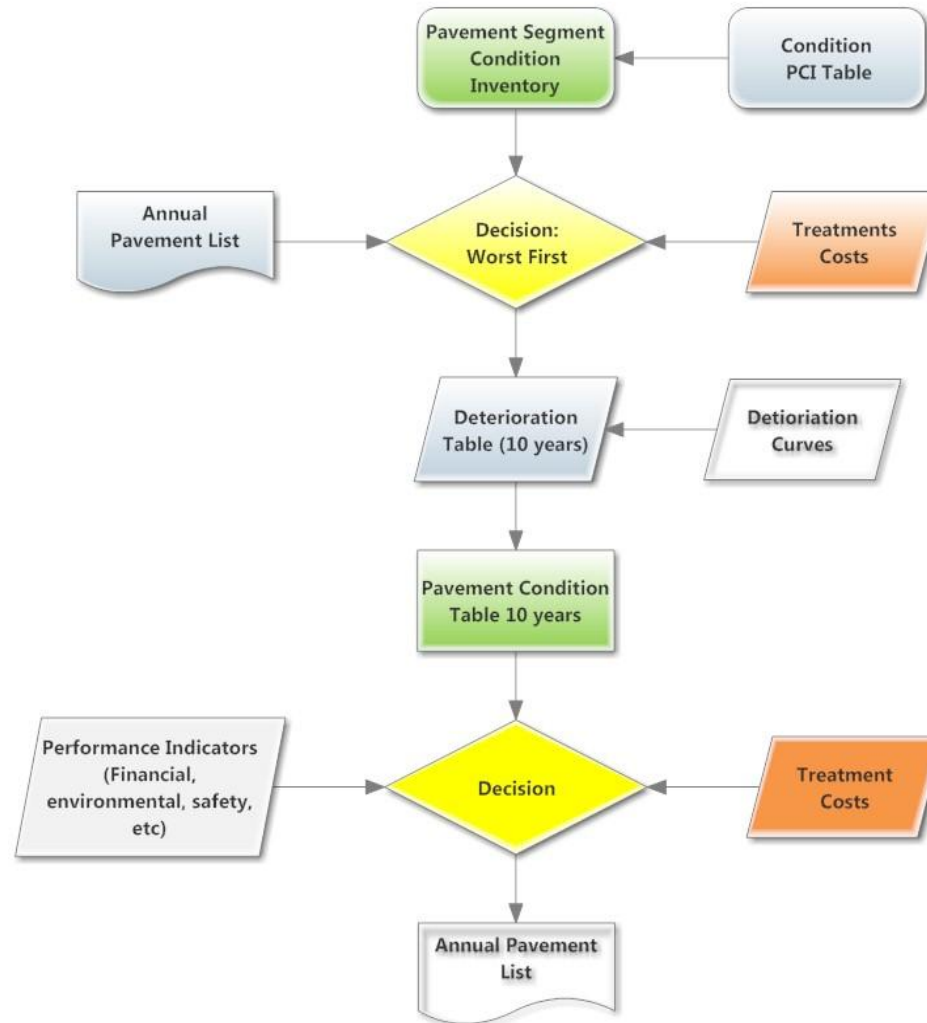
Purdue University. Indiana Local Technical Assistance Program (LTAP).

# Case Study 2: Pavement Management

- Main area that PM's applied in field to date?
- Most developed PM's?
- Often area where agency Asset Management starts
- Old way of doing business– and new way
- (See next presentation)

# Case Study 3: Pavement Management

## Pavement Management: Simplified



# Case Study III: PM's for your whole agency

- ❑ Can go thru process to generate PM's for whole agency
- ❑ Mix of:
  1. Reviewing and Adopting national best practices – they do exist (too many)
  2. Agency
    - Bottom-up
    - Top-down JAD sessions



# Case Study III: PM's for your whole agency

Description of Operations	High-level Summary of Current Typical Process	Key Stakeholders and Users	Performance Measurement
<b>Business Area #1: Services for Citizens (??title better here perhaps –“General Services”)</b>			
<b>1.</b>			
a. Roadway Planning and Design			
i. Highway Engineering			
1. Route planning	Prelim design-> public input-> detail design-> ROW acquisition	Construction; Finance; General Public	1. Time to complete process. 2. project completion
2. Geomatics (Survey and GIS)	Survey-> Data quality check --> Create cadaster and maps (various user scales)	All turnpike units; general public	Meet cadaster data collection requirements; meet agency map production standards
3. General civil engineering	Surveying -> Materials -> Environmental, Structural->Construction Transportation -> Control engineering	All turnpike units; general public	Meet numerous domain engineering design, performance & best practice standards in <i>AASHTO</i> and <i>FHWA</i> guides (e.g., the “red book”, “blue book”, etc.)
4. Electrical design	Functional specification->schematics-> wiring diagrams->contractors specs	Construction; Facilities management	1. Meet National Electrical code 2. Projects completed within time & budget
5. Hydrology design	Review wider design project ->include hydrologic design elements	Engineering; Construction; Maintenance	1. Follow Hydrologic design code 2. Projects completed within time & budget
6. Geotechnical design	Review project needs-> site investigation -> design ground improvements or foundations	Highway design, Construction	Meet ASTM Geotechnical Design Standards
7. Bridge design	Review project needs -> site investigation -> preliminary design -> final design	Highway design, Construction	Meet with criteria for the relevant <i>AASHTO</i> bridge design manual (concrete, etc.)
8. Materials specifications	Review project needs -> material specification-> contract documents	Highway design, Construction	Meet relevant material specification standards
b. Roadway Construction Program Management			
i. Construction contract letting service			
	Prepare contract docs-> gain approvals-> advertise	Clients within agency (Maintenance, Construction, Operations, etc.)	Degree to which RFP's and specs meet requirements
ii. Construction administration contract letting			
	Gain responses-> review-> Select bidder->negotiate	Clients within agency' external vendors and suppliers	Quality and number of job bids
iii. Contract oversight contract management			
	Define management team-> define oversight mechanisms-> Implement ->	Internal clients; Vendors and suppliers	Cost: completed within budget amount; Schedule: completed

# Recent AASHTO and FHWA Webinars on PM's

Example:

October 28, 2014 Webinar: *Performance Outcomes Beyond the Mainstream:*

- PM's that focus on outcomes
- *Key concerns:* accessibility, economic development and health
- *Difference:* Accessibility and Mobility; Might reduce one to enhance the other
- Health: major new PM's –major justification for bike lanes is not accessibility but health.

# What are the potential downsides of PM's?

- Work to measures, not what really best?
- Artificial measures?
- Real issues get buried behind the measures?
- Cost
- Bureacracy
- analogy to annual personnel performance reviews: do they really work?

# Case Study 4: Minnesota DOT

- See, referenced in appendix.
- Agency level reporting
- 60 page document
- Last in 2012

# Conclusions -- Personal/Group?

- ❑ Performance measures “a good thing” – without federal mandates
- ❑ Need to be applied selectively, incrementally
- ❑ Performance Measures need to be *agency specific*. If adopted blindly off-shelf will,
  - ❖ Not mean much
  - ❖ Not be geared to local political context (e.g. , PennDOT D2 v D6, etc.)

# PM – MAGTUG Ahead??

☐ Ahead:

- ❖ Needs further development?
- ❖ Should this be a continuing theme for MAGTUG?
- ❖ Perhaps developed with other organizations?
- ❖ Local cross-agency project, DVRPC led
- ❖ REVIEW AT END OF WORKSHOP??

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